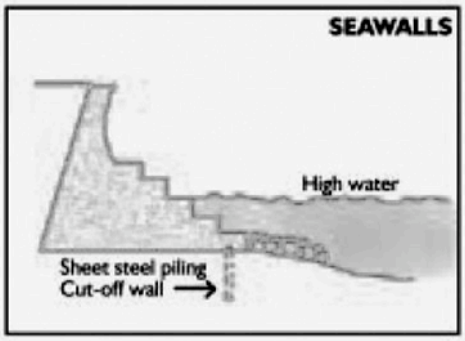
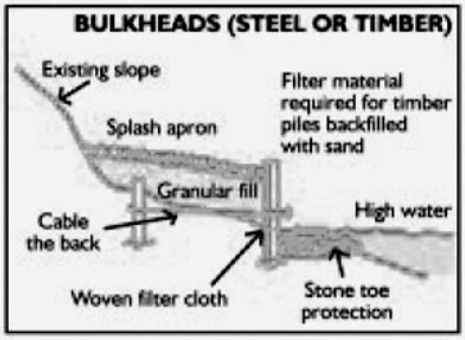
Advantages and Disadvantages of Hard Engineering Approaches to Coastal Construction



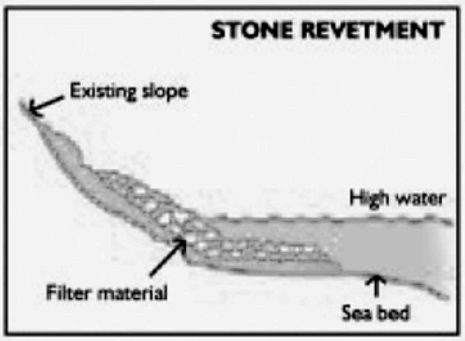
ADVANTAGES: Provides protection both from wave action and stabilizes the backshore; Low maintenance cost; Readily lends itself to concrete steps to beach; Stabilizes the backshore.

DISADVANTAGES: Extemely high first cost; Subject to full wave forces, fail from scour, flanking of foundation; Not easily repaired; Complex design and construction problem. Qualified engineer is essential; Slope design is most important; More subject to catastrophic failure unless positive protection is provided.



ADVANTAGES: Provides positive protection; Maintains shoreline in fixed position; Low maintenance cost; Materials are available locally.

DISADVANTAGES: Vertical walls induce severe beach scouring. Adequate toe protection required; High first cost; Subject to flanking; Bulkheads must be tied back securely; Pile driving requires special skill and heavy construction equipment; Complex design problem; Limits access to beach.



ADVANTAGES: Most effective structure for absorbing wave energy; Flexible — not weakened by slight movements; Natural rough surface reduces wave runup; Lends itself to stage construction; Easily repaired — low maintenance cost; The preferred method of protection when rock is readily available at a low cost.

DISADVANTAGES: Heavy equipment required for construction; Subject to flanking and moderate scour; Limits access to beach; Moderately high first cost; Difficult construction where access is limited.

Advantages and disadvantages of different shoreline protection structures (adapted from U.S. Army Corps of Engineers 1984).

Source: Tanzania Ministry of Natural Resources & Tourism. 2003. *Guidelines for Coastal Tourism Development in Tanzania.* Tanzania Coastal Management Partnership.